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the fin-folds, beside some scattering stellate mesoblastic cells which very possibly may be the pterygoblasts, which either themselves give rise to the embryonic rays or are indirectly concerned, together with the surrounding tissues, in pouring out such a homogeneous secretion. Such homogeneous substances I have found in other cavities in embryos, especially in the brain; in such cases I have been inclined to attribute their presence to the action of reagents, as extractive matters, as homogeneous, hardened acid-albumen, in short. The early advent of mesoblast into the fin-folds is at any rate a settled point, the stellate cells which wander outwards being mesenchymal, according to the terminology of the Hertwigs. In embryos of Scomberomorus I do not find the secretion noticed by Emery, homogeneous during the lophocercal condition, but loosely granular, more like the fine plasmic corpuscles found by me between the vitellus and zona radiata of the egg of Amiurus. At any rate I am not inclined to believe, after weighing the foregoing facts, that there is the slightest ground for the assumption that the fin-rays of fishes originate from the primary epiderm or larval integument, but that they arise from the mesoblast, as their position and first vascular supply would indicate. The distinction between the fin-rays as *exoskeletal*, from the other bones as *endoskeletal*, therefore breaks down on embryological grounds; for both are clearly of mesoblastic origin, as is further proven by the mode in which the insertions of the muscles which move the fin-rays originate.—*John A. Ryder.*

PSYCHOLOGY.

DOGS AS NEWSPAPER CARRIERS.—A very common thing on all the Connecticut railroad lines is for accommodating train men to throw newspapers off the trains at or near the houses of subscribers living on the line of the road at a distance from the stations. In many instances dogs have been trained to watch for the cars and get these papers, and country dogs, it is noticed, take quite an active interest in the affair. Over on the Naugatuck road some one has had the curiosity to inquire into this matter of dog messengers. Mr. Philip McLean, proprietor of the Gate House, on the Thomaston road, has a dog who goes a mile and a half every morning to meet the train. The paper was formerly thrown off by the brakeman on the last car, and there the dog watched for it. Lately it has been thrown from the baggage car. The dog appeared angry at the change, barked furiously, and waited sullenly for some time before going on his errand. He has not yet become reconciled to the new way of delivering his paper. Below Derby a dog has acted for several years as newsboy for a number of families. The papers are thrown out of the cars under full speed. Whether one or a large bundle of them, the dog is able to lug them off, making good time back. Another dog who has become a veteran as newsboy and cannot now, from age and rheumatism, get down to the cars, has in some way managed to train a younger dog to do his work. Edward Osborne, residing below Naugatuck, has a dog who regularly meets the early morning train. The house is a mile away from the railroad, and the dog never leaves on his errand until he hears the train whistle at Beacon Falls station. Then he starts on a run and waits at the same spot always, with his nose poked between the palings of a fence and his keen eyes watching for the flying paper. A story is told of one dog that was first taught to bring a certain New Haven paper, and when his master changed to another could not be induced to carry the new one. This is unlikely. Another story is that the late Senator William Brown, of Waterbury, had a pet dog that could readily distinguish the whistles of the New England engines from those of the Naugatuck, though running on a parallel track at the same time side by side. The faithful dog always found his train and car, and stood in waiting for the Hartford *Times*, which he carried home to his master for many years.—*Hartford* (*Conn.*) *Times.*

HEARING AND SMELL IN ANTS.[1]—In the investigation of the senses of the lower animals, especially of invertebrates, the best efforts of the student are often rendered inconclusive from the fact that, for aught we know, the sense-organs possessed by them may respond to vibrations which produce no effect upon us, and thus they may possess senses of which we have no idea, though they may lack what we can identify as hearing, taste, or smell. So long as a creature possesses eyes, we feel sure that it sees, though we may know that its perceptions are very limited; but it will not do to say that an animal cannot hear, only because it cannot hear sounds audible to us. For this reason Sir J. Lubbock carefully guards himself from the assertion that ants cannot hear; although all attempts to induce them to take notice of sounds audible to us proved failures. Not content with trying the most intense and the most acute sounds upon a colony of ants, and also upon single ants, he endeavored to ascertain whether ants could produce sounds intelligible to themselves, though inaudible to us. To this end he placed some honey upon one of six small pillars of wood set upon a board frequented by the members of a domesticated colony of *Lasius flavus.* Three ants were placed at the honey, and then imprisoned near it; then three others, which were also imprisoned. Numerous ants were moving round the board in search of food, and Sir J. Lubbock reasoned that if ants can make any sound intelligible to other ants, the imprisoned ants would tell the searchers of the food. On the first occasion only seven ants found the honey in three hours—no more than visited the pillars which had no honey. But when the ants which had eaten the honey were

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[1] Résumé from the *Revue Scientifique*, of an extract from the work of Sir J. Lubbock, entitled Ants, Wasps and Bees, Experimental studies on the organism and habits of hymenopterous insects.

freed, fifty-four ants found the honey in half an hour. Other days of experiment resulted in the same manner. Thus it became evident that, if the imprisoned ants made sounds inaudible to us, those sounds had no meaning to their companions. A sensitive flame was not affected by anything the ants did, and a microphone, though it made their footsteps audible, gave no indication of any other sound. Remembering, however, that all vibrations between 35,000 per second, the highest perceived by the human ear, and 470,000,000 per second, which produce the sensation of red light, are only perceived by us as heat; and mindful also of the curious sense organs present upon the antennæ, Sir John Lubbock is still of opinion that ants have a sense cognate to what we call hearing. These antennal organs are of two kinds, one of which occurs in other insects, but the other seems to be peculiar to ants. The latter consist of an exterior and interior chamber, connected by a long narrow tube. A nerve ends in the interior chamber. The whole apparatus resembles a stethoscope, and Professor Tyndall and Sir J. Lubbock are of opinion that it serves for a similar purpose. Besides a group of these in the terminal segment of the antennæ, there are one or two in each succeeding segment. Moreover, ants have an apparatus consisting of several serrated ridges at the junction of some of the abdominal segments, and similar to an organ which in *Mutilla europæa* produces sounds audible to us. The inference is, that since Mutilla is not very distantly related to the ants, the apparatus possessed by the latter serves a purpose similar to that possessed by the former.

Experiments made upon the sense of smell showed that ants ear very sensitive to odors that produce the sensation of scent in us.

PSYCHICAL RESEARCH[1].—The Proceedings of the Society for Psychical Research are certainly remarkable amongst the literature of the present century and, rightly considered, are amongst the most interesting. The reports of the various committees are published primarily for the edification of the members, but they also court public criticism, and as a simple matter of fact they are worthy of all attention. It has been known for a long time that certain phenomena do occur amongst a certain class of persons which are, to say the least, inexplicable, for though it may be urged that collusion and connivance, conjuring and deceit, may be practiced occasionally, there is now a mass of trustworthy evidence demonstrating the truth of the hypothesis that thoughts are transferred from one person to another.

It must be conceded that until we can fully explain the mechanism of thought as found in any individual, that we have no right to say that it is impossible for one person to transfer his thoughts to another; and to go further, we might say that until we can fully explain the phenomena of electricity we have no right to attempt to define the bounds of possibility in nature. Electricity has been known and utilized for years, but we are no nearer to a definite idea of what it really is than we were in the time of Volta and Galvani. There is ample material to enable us to form a good working hypothesis, and so also by a parity of reasoning there is quite sufficient to enable us to affirm that there is more in thought transference than those unacquainted with the phenomena have been willing to allow. In the second report of the committee on thought reading, or, more properly, thought transference, it is taken as established that "much of what is popularly known as 'thought reading' is in reality due to the interpretation by the so-called 'reader' of signs, consciously or unconsciously imparted by the touches, looks or gestures of those present, and that this is to be taken as the *prima facie* explanation whenever the thing thought of is not some visible or audible object, but some action or movement to be performed," and also that "there does exist a group of phenomena * * * which consist in the mental perception, by certain individuals at certain times, of a word or other object kept vividly before the mind of another person without any transmission of impression through the recognized channels of sense." The evidence the society is able to offer is fairly conclusive, and is certainly of such a character that it must be fairly met before its assumptions can be pooh-poohed in the orthodox manner.

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[1] Proceedings of the Society for Psychical Research, Vol. I, Parts II and III. London, Trübner & Co.

Of the phenomena of dreams, chance coincidence, so-called apparitions, and what may be termed mental telephony, or telescopy, there is rather too much in the Proceedings, for there are so many authenticated cases that there is no reason to doubt that coincidences of the kind do occur; still, there is something weird in a case where a person saw others walking up the path towards the front door of her house at the very time they were drowned, and when we learn that the person actually ran to inform her friends that the others were coming up the garden, we can only conclude that there was some mistake, or that there was some actual transference of thought. The third report of the committee on thought transference contains the results of their experiments in a tabular form. Thus, with the trials to test the hypothesis of collusion, the actual results were one right guess in five and a quarter experiments (we give the totals only), while the chance of success by accident was only one in forty-three. In the series of experiments to test the hypothesis of chance coincidence, when the chances against success were fifty to one, upwards of forty per cent of the guesses were right, if the second and an occasional third response are admitted; but if the tests are confined to the first guess only the percentage is twenty-one, when, according to the laws of chance, the correct answers would have been less than two per cent. The committee pertinently observe that their experiments derive much strength and coherence from their very multitude and variety; they have eliminated, as far as possible, the hypothesis of collusion, chance coincidence, and muscle or sign reading, and they are left with an accumulation of experiments which indicate clearly that thought transference is a possibility, or that there is some flaw in the evidence which they have been unable to discover. The third part of the Proceedings contains the first report of the committee on "mesmerism" and the first report of the Reichenbach committee, both of which will be found to contain a great deal more than is dreamt of in the philosophy of the ordinary world, though the committees respectively declare in the one case that they prefer to defer the publication of results, until a more complete reproduction of the experiments of others with added tests of their own have afforded a wider basis for discussion. The society has fairly established its demand for an inquiry by the scientific world, ever the most skeptical, and properly so, for it is the duty of science to reject everything that is not proven, while desirous, nay anxious, to take up any line of investigation that may lead to discoveries the ultimate result of which it cannot foresee.—*English Mechanic.*

ANTHROPOLOGY.[1]

THE PROTO-HELVETIANS.—The lowering of the levels of lakes Neuchatel and Bienne by the so-called "correction" of the Jura (a work undertaken for the prevention of floods) though it has by no means added to their beauty, is proving an immense gain to archæology. It has laid bare many Lacustrine stations, and rendered easy explorations which would otherwise have been impossible. Instead of the slow and often profitless process of dredging and picking up stray objects from between the piles at low water, the shrinkage of the lakes has permitted systematic excavations to be made in their former beds, on grounds which the Swiss antiquaries call the *couche archéologique*. The results are surprising beyond measure; besides throwing a flood of light on the history, the habits, and the civilization of the race of men who, thousands of years before the Christian era, made their homes on the lakes of Central Europe, and to whom has been given the apt name of Proto-Helvetians, they serve to correct old theories and suggest new conclusions. An idea of the richness of the finds made during the last ten years may be formed from the fact that the number of relics brought to light on lakes Bienne and Neuchatel since 1873, amounts to 19,599, of which 13,678 have been acquired by various Swiss museums. Nearly 6000 have been added to the collection of Dr. Goss, at Neuveville, on Lake Neuchatel, who has undertaken many explo-

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[1] Edited by Prof. OTIS T. MASON, National Museum, Washington, D. C.